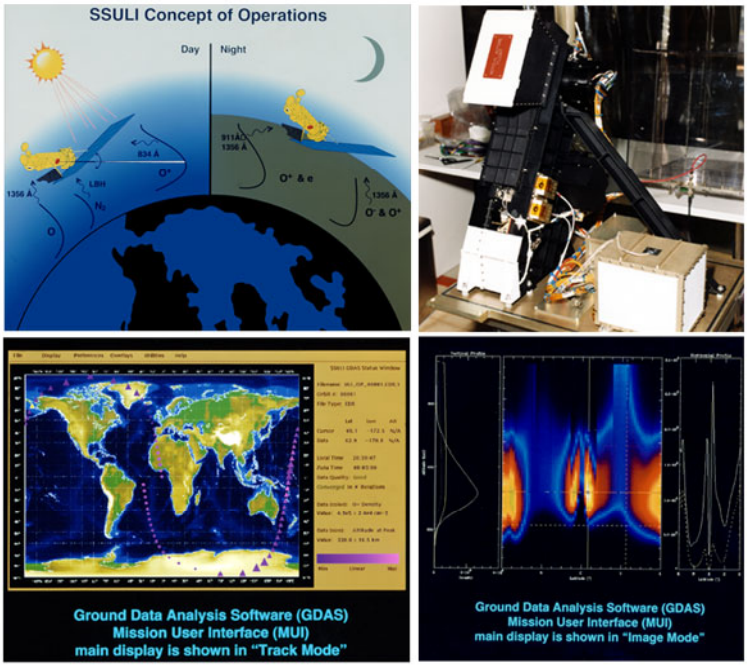
Special Sensor Ultraviolet Limb Imager (SSULI)



NRL's Space Science Division's basic research program of thermospheric and ionospheric physics and ultraviolet remote sensing has led to the development of new techniques for optical remote sensing of ionospheric and neutral atmospheric densities from space. New ultraviolet sensors have been constructed to measure limb profiles of atmospheric airglow. New algorithms have been generated to convert these measurements into neutral and electron density profiles. The Defense Meteorological Satellite Program has adopted these new techniques in the form of an NRL-developed operational sensor system called SSULI for inclusion on its Block 5D3 operational weather satellites. A series of five SSULI instruments built by NRL will provide long-term continuous monitoring of space weather beginning in 2001. A proof-of-concept instrument called the Low Resolution Atmospheric Airglow Spectrograph (LORAAS) was launched aboard the STP P91-1 ARGOS satellite in February, 1999 and obtained 3 years of airglow observations.

Using science algorithms developed at NRL, operational software will be delivered to the Air Force Weather Agency. The software converts instrument observations into a number of environmental parameters. In addition, NRL is delivering a display software package to aide analysis and identify regions of interest by Air Force personnel.

Among the environmental parameters determined from the SSULI observations are ionospheric and neutral density profiles. Global monitoring of ion densities will be used to improve a number of systems that rely on radio frequency propagation including: HF communication and

over-the-horizon radar and HF geolocation precision geopositioning. Neutral density profiles from SSULI will aid vehicle reentry solutions and satellite tracking.

Long-term monitoring of ionospheric and neutral density will provide information about global change due to a build up of greenhouse gas.

For additional information, please contact:

Mr. Stefan Thonnard
Naval Research Laboratory
Code 7607
Washington, D.C. 20375-5352
Telephone: (202) 767-5041
Fax: (202) 767-0497
Email: sthonnard@SSD5.nrl.navy.mil